Technical Reports:
Concept of Technical Innovation

POINTek, Inc.

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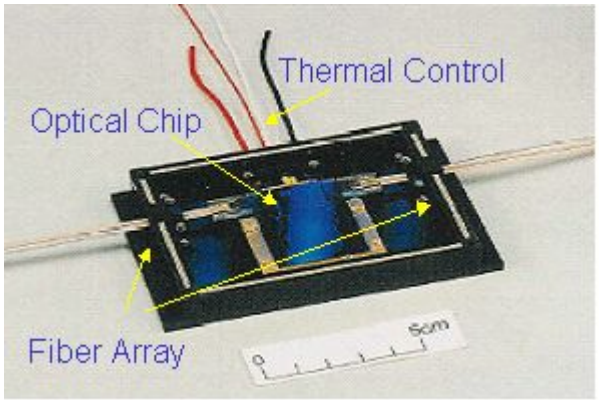
- Technical Demands to Overcome the Limitation of Conventional Optical Devices
  - Integration, **Cost** & Quality Competition, **Scalability**, Compact Size, …
- High Value Added and Integrated Optical Device Technology Based on Planar Fabrication Process
- Packaging Technology Is a Critical Technology to Determine the Device Reliability & Const Competitiveness.
  - Determines Device Reliability.
  - Takes > 50~90% of Production Cost.

Planar Optical Device



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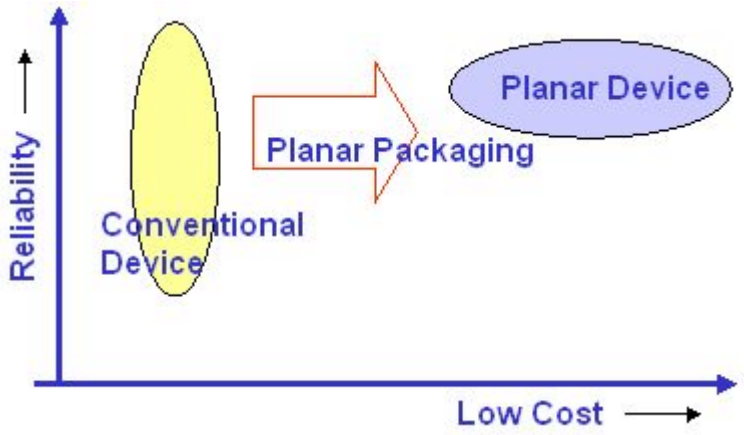
Mission of Planar Optical Packaging



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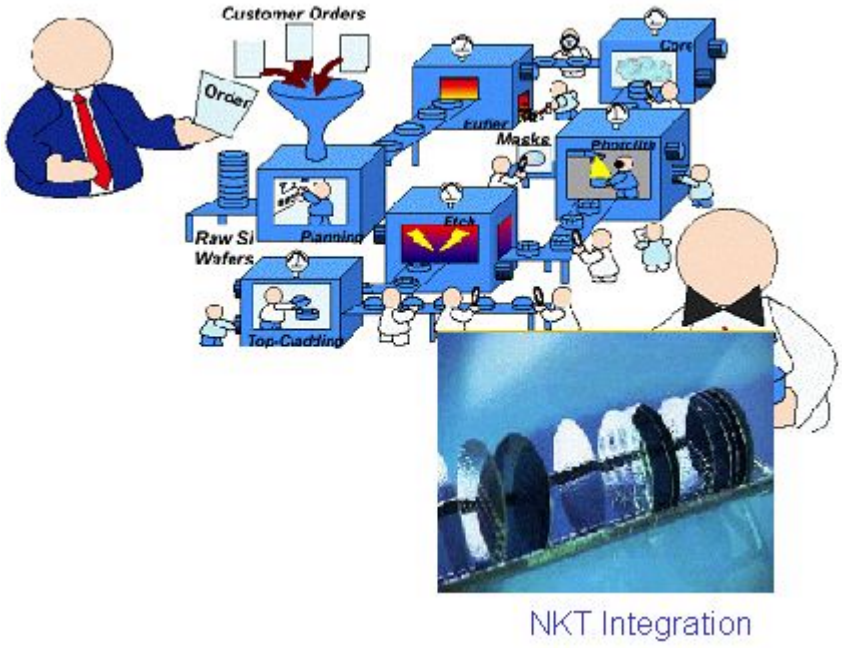
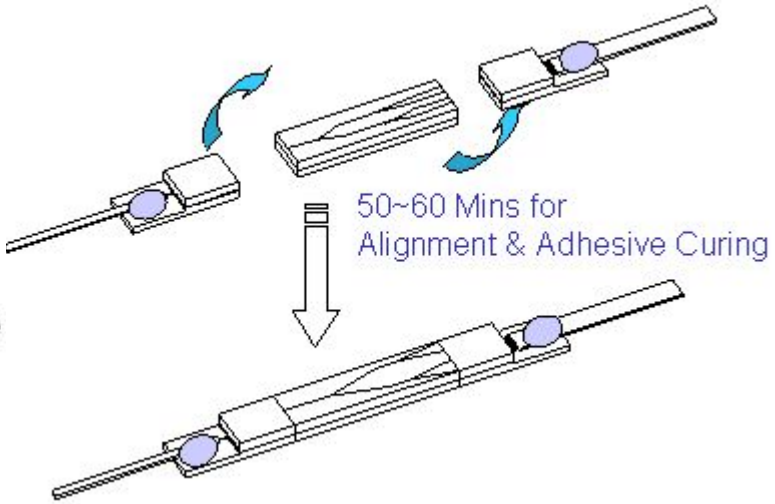
- Technical Improvement
  - Remarkable Improvement in PLC Chip Technology in the Last 10 Years.
  - **No Technical Improvement** in **Planar Packaging** in the Last 10 Years.
    - Many Trials for Cost-Effective Technology: Ex. Passive Alignment





Mass-Production in PLC Chip Fabrication

Very Limited Production in Chip-Fiber Alignment

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3. Planar Packaging Process Analysis: Active *vs.* Passive

- Process Bottleneck
  - Active Alignment
    - Cleaning
    - **Active Alignment: 5~10Min**
    - **Curing: 40Min**

      ⟹ **On Alignment Stage**
    - Housing
    - Measurement
  - Passive Alignment
    - Cleaning
    - **Passive Alignment: 5~10Min**
    - **Curing: 40Min**

      ⟹ **Not Associated with Alignment Stage**
    - Housing
    - Measurement

  - **Expensive Alignment Equipment** and **Human Resources** Are Sustained during Active Alignment and Adhesive Curing Process.
  - **Machinery Automation** Will Not Solve the "Low-Cost" Issue.
  - Conventional Passive Alignment Approach May Provide **200~250%** Productivity Improvement.
  - However, **Due to the Low Productivity of Conventional Active Alignment Process**, 250% Productivity Improvement by Passive Alignment Will Not Be Enough to Provide the "Cost-Effective" Solution.

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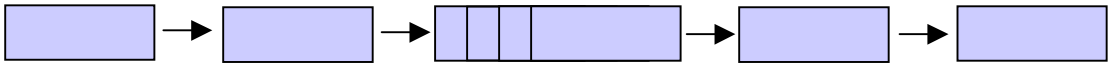
4. Concept of Technical Innovation to Solve the Cost Issue

- Multiple Array Alignment Packaging Process (MAAP™): Practical Scale-up Process
  - **Unique Innovative Scale-up** Technology for Productivity Solution
  - **Unique Innovative Reduction of Resources** (Human, Facility Investment, ..)
  - Very Large Scale Massive Alignment Technology for Practical Application

Current PLC Active Alignment Process

Conventional Approach for Cost Solution: Productivity Improvement by Machinery Automation



Serial Approach

No Report for Successful Adoption Yet!

POINTek's MAAP™ Process: Productivity Improvement by Process Innovation

Parallel Approach

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